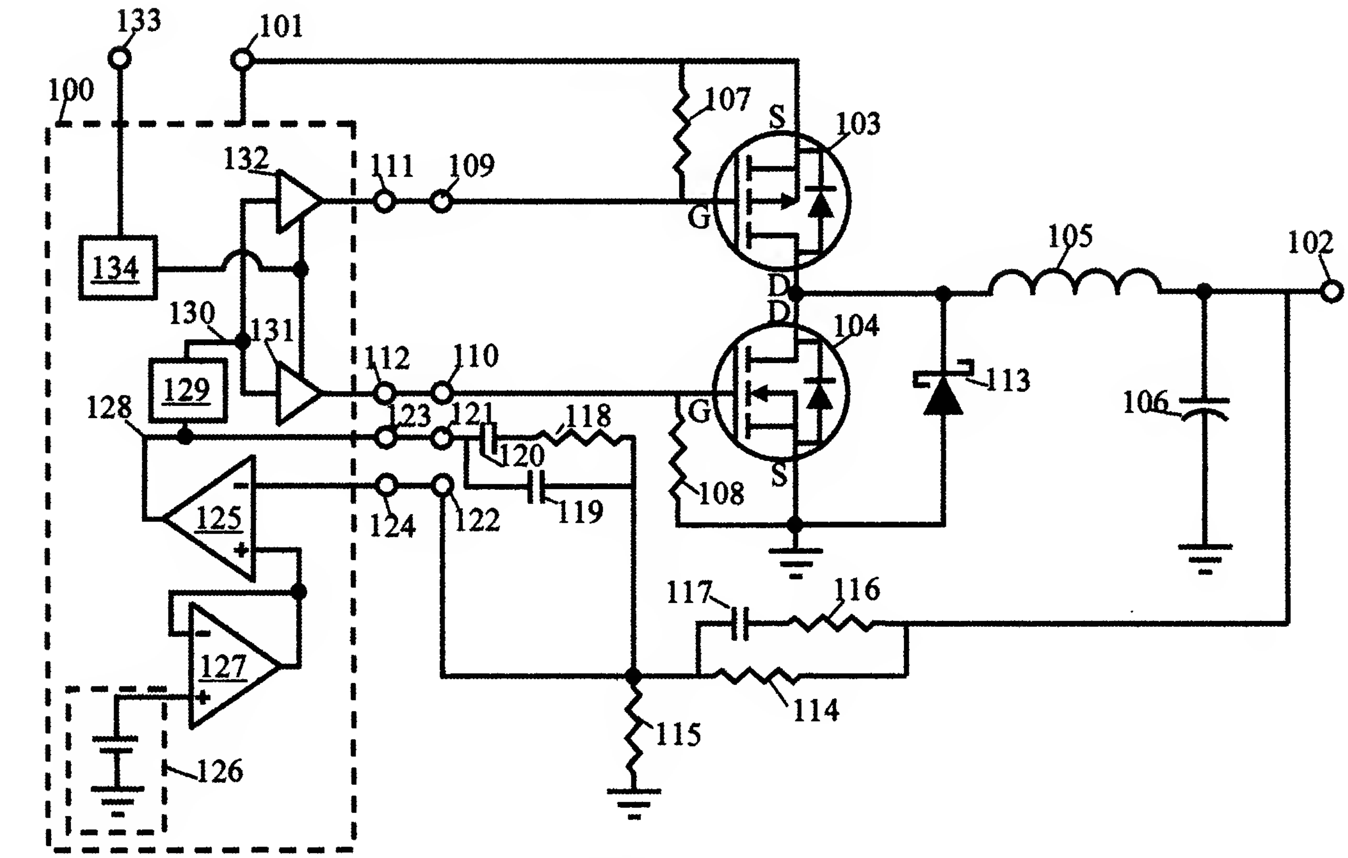
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105
102
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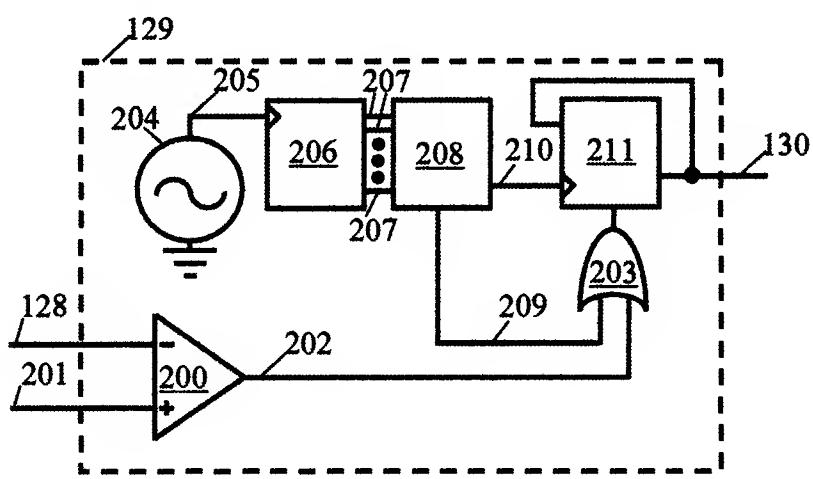
126

FIG. 1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200

FIG. 2

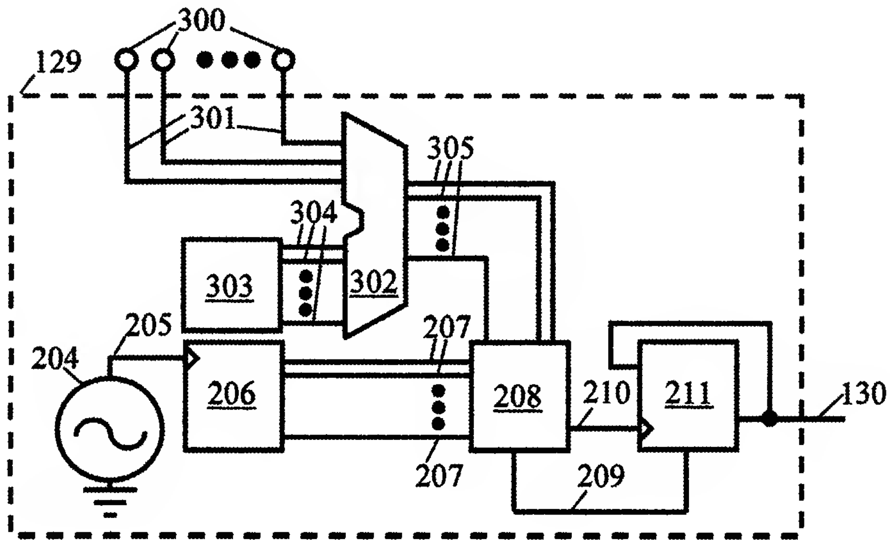


FIG. 3

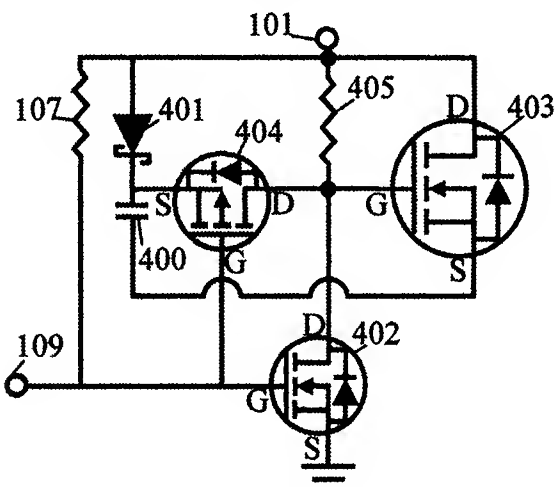


FIG. 4

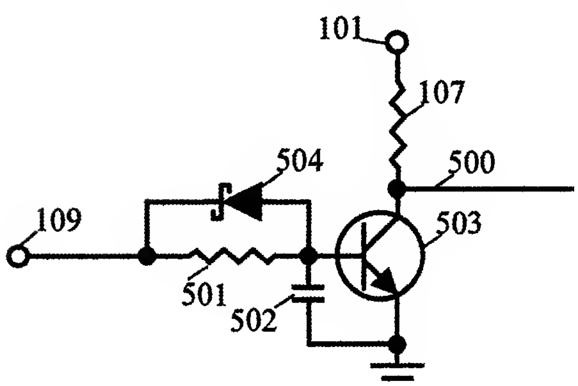
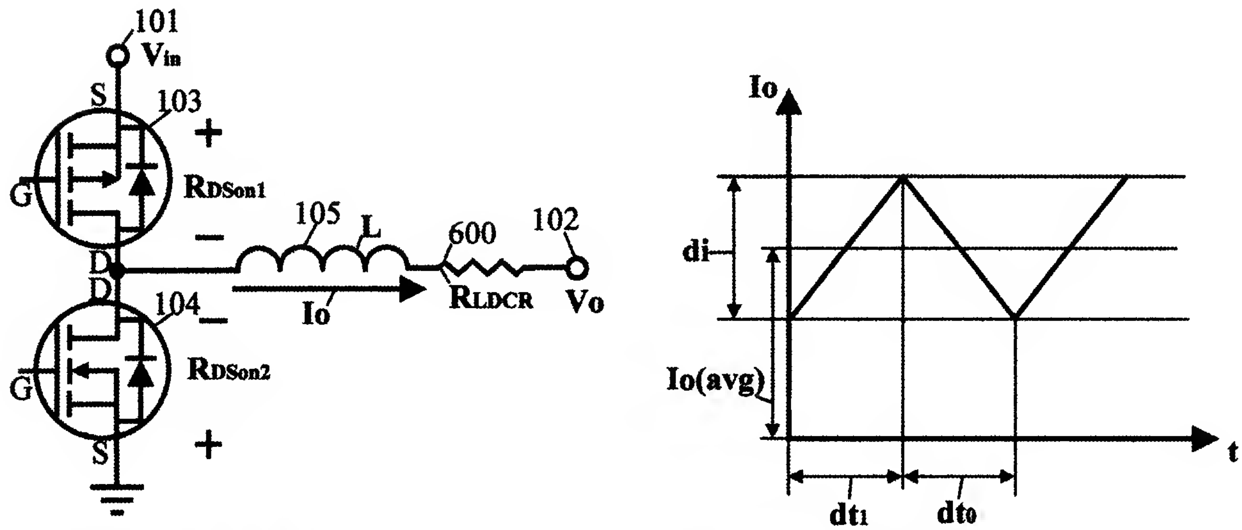


FIG. 5



Kirchhoff's Voltage Law, 103 on, 104 off (dt1):

$$0 = V_{in} - I_o(R_{DSon1} + R_{LDCR}) - L\frac{di}{dt_1} - V_o$$

$$\therefore V_o = V_{in} - I_o(R_{DSon1} + R_{LDCR}) - L\frac{di}{dt_1}$$

$$\boxed{\therefore di = \frac{dt_1}{L}(V_{in} - V_o - I_o(R_{DSon1} + R_{LDCR}))} \quad 602$$

Kirchhoff's Voltage Law, 103 off, 104 on (dt0):

$$0 = L\frac{di}{dt_0} - I_o(R_{DSon2} + R_{LDCR}) - V_o$$

$$\therefore V_o = L\frac{di}{dt_0} - I_o(R_{DSon2} + R_{LDCR})$$

$$\therefore L\frac{di}{dt_0} = V_o + I_o(R_{DSon2} + R_{LDCR})$$

Choose L, Fs such that di < 2($Io_{(min)}$) for continuous mode operation, (for this analysis to apply)

$$\therefore V_o = V_{in} - I_o(R_{DSon1} + R_{LDCR}) - L\frac{di}{dt_1} = L\frac{di}{dt_0} - I_o(R_{DSon2} + R_{LDCR})$$

$$V_{in} = Ldi\left(\frac{1}{dt_1} + \frac{1}{dt_0}\right) + I_o(R_{DSon1} - R_{DSon2}) \qquad SwitchingFrequency \equiv F_s = 1/(dt_1 + dt_0)$$

$$V_{in} = Ldi\left(\frac{dt_0 + dt_1}{dt_1(dt_0)}\right) + I_o(R_{DSon1} - R_{DSon2}) \qquad DutyCycle \equiv \delta = dt_1(F_s) \therefore dt_1 = \delta / F_s$$

$$V_{in} = L\frac{di}{dt_0}\left(\frac{1}{\delta}\right) + I_o(R_{DSon1} - R_{DSon2}) \therefore L\frac{di}{dt_0} = \delta(V_{in} - I_o(R_{DSon1} - R_{DSon2}))$$

$$L\frac{di}{dt_0} = \delta(V_{in} - I_o(R_{DSon1} - R_{DSon2})) = V_o + I_o(R_{DSon2} + R_{LDCR})$$

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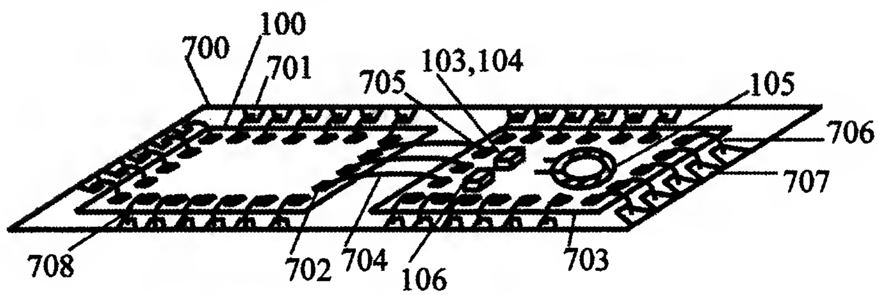
$$\boxed{\therefore V_o = \delta(V_{in} - I_o(R_{DSon1} - R_{DSon2})) - I_o(R_{DSon2} + R_{LDCR})}$$

FIG. 6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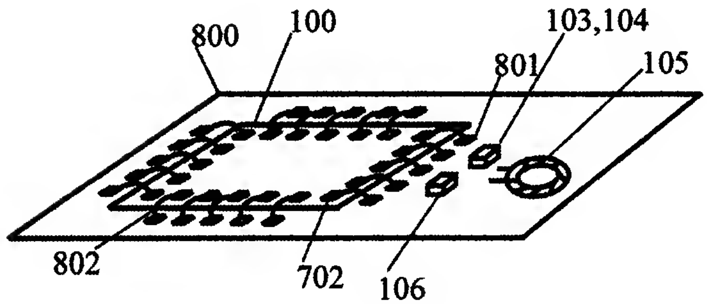
702
704
106
703

FIG. 7


800
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103,104
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106

FIG. 8